

**REMARKS**

Claims 1, 3-6, 15 and 17 were rejected under 35 USC § 103(a) as being unpatentable over Spahn (6,237,529) in view of Green (5,584,935) and Yamazaki (U.S. 2001/0006827).

Claim 1 is believed to be representative of the claims in this case. It sets forth a thermal physical vapor deposition source for vaporizing solid organic materials to form a layer at reduced pressure on an organic light-emitting diode. The Examiner points out that Spahn teaches that the vapor deposition source can include an electrically insulative material (56) surrounded by a resistive heater.

Additionally, the Examiner recognizes that Spahn does not teach that the electrically insulative container can be additionally heated by a bias heater. It must be pointed out that Spahn only has one power source for applying potential to the heater. This means that the housing (10 in the Spahn patent) can not be heated separately from the top plate (20) and baffle member (30). In the present invention, a bias heater is used having side walls and a bottom wall wherein the bias heater side walls are shorter than the container walls. In claim 1, the Examiner's attention is called to the fact that element d) specifies "means for controllably applying an electrical potential to the bias heater in response to a control signal provided by a bias heater temperature-measuring device to cause controlled bias heat to be applied to the solid organic material in the container, the controlled bias heat providing a bias temperature which is insufficient to cause the solid organic material to vaporize."

No such structure is found in the Spahn reference.

In column 5, lines 30-39, Spahn specifies the structure for heating the organic material. Spahn's heating arrangement is for vaporizing the material, and not for providing a bias temperature, which is insufficient to cause the solid materials to vaporize. In element d), an electrical potential is applied to the vaporization heater, which in fact causes vaporization heat to be applied to the uppermost portions of the solid organic material in the container. By means of this arrangement, the uppermost portions are vaporized and projected onto the structure through the efflux aperture to form the organic layer. Claim 1 is believed to define

unobvious subject matter. Claims 3-6, 15 and 17 depend upon claim 1 and should be allowed along with it.

Turning now to Green, this reference relates to a process and apparatus for forming an electrochromic layer (not OLED), specifically metal oxide layers. Green's container has an open top portion in which the vaporized material is directed. Green does not use a vaporization heater disposed on upper side wall surfaces of the container, does not include slit apertures, and does not form organic layers. The Green heater is comprised of a molybdeum strip connected to cables placed in an alumina housing. Green does not have two separate heaters and nothing corresponding to the bias heater found in claim 1. Green does not contain efflux apertures. The reason these apertures are provided in the present invention as well as in Spahn is to improve deposition quality and uniformity of the OLED layer. Clearly, one skilled in the art would not use the Green design to form OLED layers. Applicants fail to see how Green can reasonably be combined with Spahn. First of all, it is believed that Green is nonanalogous art and one would not look in this area to find references. Still further, Green is not suitable for forming effective OLED layers and Applicants fail to see how these references can be combined. There is only one heater in Spahn and Green.

It is true that Yamazaki teaches that there should be movement of the evaporative source. However, the evaporative source is not set forth in any detail in Yamazaki. Yamazaki provides no teaching of two different heating arrangements such as required by claim 1. Yamazaki provides no motivation for the structure of claim 1 or claim 2. Yamazaki is directed to a system and Spahn is directed to an extended source. Green is also directed to an extended source that is different from the Spahn source and which is for depositing different materials (specifically not OLED materials).

Claims 2, 8-14, 16 and 18 were rejected under 35 USC § 103(a) as being unpatentable over Spahn in view of Green and Yamazaki (US 2001/0006827) for the reasons stated above, taken in further view of Tanabe (US 2001/0008121) and Takagi (4,197,814).

Claim 2 is similar to claim 1 but also sets forth in element c) the use of a deposition rate-measuring device to control vaporization heat. Claim 2 should be allowed for the same reasons set forth with regard to claim 1. Therefore, neither Spahn, Green, or Yamazaki disclose such an arrangement. Tanabe does have a temperature control unit, but it is a rather vague disclosure of a thermal physical vapor source shown. The present invention makes use of an extended source, which includes a slit aperture (not shown in Tanabe). Applicants fail to see how Tanabe can reasonably be combined with any of the other references. Takagi has a container 2 surrounded by a resistance heater 3, but the disclosure is so sketchy that there is little or no disclosure of the source. Claims 8-14, 16 and 18 depend upon either claims 1 or 2 and should be allowed along with them.

Claims 7 and 12-14 were rejected under 35 USC § 103(a) as being unpatentable over Spahn in view of Green and Yamazaki (US 2001/0006827) and in further view of Tanabe (US 2001/0008121) and Takagi (4,197,814) for the reasons stated above and in further view of Steube (4,233,937).

Claim 7 is a dependent claim and claims 12-14 are also dependent claims and they should be allowed with their base claims. The other references have been discussed, but Takagi discloses an arrangement for depositing compounds of semiconductors (not OLED materials) and these sources are certainly different than the source specified in independent claims 1 and 2. The vaporized materials are “jetted” from the sources and are additionally ionized (“ionized” in ionization chambers).

Turning to Steube, Applicants fail to see why this reference would have any suggestion for combination with any of the cited references. Steube does indeed teach the use of a screw drive for a vacuum evaporative source, but this source is not directed to OLED and is considerably different than the source claimed in claims 1 and 2.

In view of the foregoing, it is believed none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this

application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,



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